

Oluwafemi A. Oyedeji

865-576-1397

oyedejia@ornl.gov

EDUCATION

Ph.D. in Biosystems Engineering , University of Tennessee, Knoxville, USA	2019
MS in Chemical Engineering (Computational Science Minor) University of Tennessee, Knoxville, USA	2018
MS in Biosystems Engineering , Auburn University, Auburn, USA	2015
B.Eng. in Agricultural Engineering , Federal University of Technology, Akure, Nigeria	2011

PROFESSIONAL EXPERIENCE

R&D Assistant Staff 03/2019 – To present

Environmental Sciences Division, Oak Ridge National Laboratory, USA

- Calibrating algorithms using field data
- Applying mathematical and numerical models to gain insight into supply chain performance and critical design criteria
- Conducting model verification and validation analyses
- Performing statistical analysis to quantify biomass variability and uncertainty
- Developing algorithms to predict changes in biomass composition and format during harvest, storage, and pre-processing
- Developing algorithms to estimate cost and resource requirement of new, innovative biomass harvest, storage, pre-processing, and handling technologies.

Graduate Research Assistant 08/2015 – 01/2019

Biosystems Engineering Department, University of Tennessee, Knoxville, USA

- Developed a comprehensive computational fluid dynamics model for gasification and pyrolysis process using OpenFOAM
- Modeled the flow of non-spherical particles as discrete elements in LIGGGHTS
- Developed and implemented machine learning analytics for understanding bioprocess
- Developed a stoichiometric equilibrium model for gasification process
- Modeled the kinetics of biomass pyrolysis and studying the production of hydrogen via the steam reforming of shale gas
- Prepared and evaluated shale gas steam reforming catalysts for hydrogen production
- Mentored five undergraduate and one master's degree students
- Evaluated and troubleshoot reactors for pyrolysis, gasification, and steam reforming experiments
- Published peer-reviewed articles on research findings.

Graduate Teaching Assistant 08/2017 – 12/2018

Biosystems Engineering Department, University of Tennessee, Knoxville, USA

- Graded undergraduate examination, assignments, and papers
- Evaluated students' grades and assessed students' educational needs and progress.

ASTRO (Advanced Short-Term Research Opportunity) Researcher 05/2015 – 08/2015

Oak Ridge National Laboratory, Oak Ridge, USA

- Simulated the hourly moisture content of corn stover across the United States
- Assisted in the organization of a weekly journal review club
- Published one peer-reviewed article on research findings.

Graduate Research Assistant 08/2013 – 05/2015

Biosystems Engineering Department, Auburn University, Auburn, USA

- Designed and implemented experiments to investigate the processing of particulate solid fuels
- Implemented several statistical analyses and modeling schemes for understanding logistics process

- Characterized solid fuels (flow, physical, chemical properties) for the multi-million dollars Integrated Biomass Supply Systems Project
- Mentored two Research Experience for Undergraduates (REU) Program fellows
- Published three peer-reviewed articles on research findings.

Youth Corps Member

12/2011 – 10/2012

Agricultural and Environmental Engineering Department, Obafemi Awolowo University, Nigeria

- Organized and conducted tutorial classes for undergraduate students
- Graded undergraduate tutorials and laboratory exercises
- Published one peer-reviewed article on research findings.

Research Trainee

04/2010 – 10/2010

Civil Engineering and Surveying Unit, Benin-Owena River Basin Authority, Ikere Ekiti, Nigeria

- Participated in the supervision of Ogbese Multipurpose dam construction
- Planned and coordinated land acquisition programs for farmers.

AWARDS AND SCHOLARSHIPS

- **Your Science in a Nutshell Award (2019):** Award recognizes the ability of researchers to quickly and accurately convey the importance of their work.
- **Face of ASABE (2018):** One of thirteen members of the American Society of Agricultural and Biological Engineers (ASABE) recognized for exemplary accomplishments that serve as inspiration to their peers, the public, and future engineers who will follow in their footsteps.
- **Chancellor Fellowship (2015 – 2019):** A special fellowship provided by the University of Tennessee Chancellor to attract and retain high-quality Ph.D. students.
- **Hazlewood Scholarship (2017 – 2018):** Award recognizes outstanding students in the College of Agricultural Sciences and Natural Resources at the University of Tennessee in Knoxville.
- **Department of Agricultural Engineering Prize (2011):** Award celebrates the best graduating student of the Department of Agricultural Engineering at the Federal University of Technology, Akure.
- **Prince Adegbule Adesida Memorial Prize (2011):** Award celebrates the best graduating student of the Department of Agricultural Engineering at the Federal University of Technology, Akure.

PROFESSIONAL AFFILIATIONS

- **Member (2019 – To present):** American Chemical Society.
- **Member (2014 – To present):** American Society of Agricultural and Biological Engineers.
- **Member (2014 – To present):** Canadian Society for Engineering in Agricultural, Food, & Biological Systems.

REFEREED PUBLICATIONS

- Oyedeji, O.A., Abdoulmoumine, N. H. 2020.** Equilibrium modeling and analysis of the formation of inorganic contaminants during biomass gasification. *Transaction of ASABE*.
- Oyedeji, O.A. Abdoulmoumine, N. H. 2020.** Computational fluid dynamics and discrete element simulation of the formation of inorganic syngas contaminants during lignocellulosic biomass gasification. *Sustainable Energy & Fuels* (4): 4219–4231.
- Yan, J., **Oyedeji, O.A.**, Leal, J.H., Donohoe, B., Semelsberger, T.A., Li, C., Hoover, A., Sun, N., Webb, E., Bose, E., Zeng, Y., Williams, L., Schaller, K., Ray, A.E., Tanjore, D. **2020.** Characterizing variability in lignocellulosic biomass – A review. *Sustainable Chemistry & Engineering* 8(22): 8059–8085.
- Oyedeji, O. A., Gitman, P., Qu, J., Webb, E. 2020.** Understanding the impact of lignocellulosic biomass variability on size reduction process – A review. *Sustainable Chemistry & Engineering* 8(6): 2327–2343.
- Oyedeji, O. A., Young, A., and Fasina, O. 2017.** Bending properties of loblolly pine. *Industrial Crops and Products* 109(1): 905-911.
- Oyedeji, O. A., Daw, C. S., Labbe, N., Ayers, P, D., and Abdoulmoumine, N. H. 2017.** Kinetics of the release of elemental precursors of syngas and syngas contaminants during switchgrass devolatilization. *Bioresource Technology* 244(1): 525-533.

- Oyedeji, O. A.,** Sokhansanj, S., and Webb, E. **2017.** Spatial analysis of stover moisture content during harvest season in the united states. *Transaction of ASABE* 60(4): 1015-1023.
- Oyedeji, O. A.,** and O. Fasina. **2017.** Impact of drying-grinding sequence on loblolly pine chips preprocessing effectiveness. *Industrial Crops and Products* 96(1): 8-15.
- Oyedeji, O. A.,** O. Fasina, S. Adhikari, T. McDonald, and S. Taylor. **2016.** The effect of storage time and moisture content on grindability of loblolly pine (*Pinus taeda* L.). *European Journal of Wood and Wood Products* 74(6): 857-866.
- Ogunsina, B. S., Ojolo, S. J., Ohunakin, O. S., **Oyedeji, O. A.,** and Matanmi, K. A. **2014.** Pyrolytic conversion of spent palm fruit bunches into biofuels. *Journal of Raw Materials Research* 8(1&2): 50-60.

BOOK CHAPTERS

- Adhikari, S., Abdoulmoumine, N., Nam, H., and **Oyedeji, O.** **2017.** Chapter 16. Biomass gasification producer gas clean-up. In: Dalena, F., Basile, A., and Rossi, C. (Eds.), *Bioenergy Systems for the Future - Prospects for Biofuels and Biohydrogen*. (1st ed., pp. 541-558). Cambridge, United States: Elsevier Ltd.

NON-REFEREED PUBLICATIONS

- Fasina, O., **Oyedeji, O.A.,** Olatunde, O., Adhikari, S., and McDonald, T. **2016.** Biomass size reduction: Necessary evil. *Auburn Speaks – On Biofuels in the Southeast*. 86-93.

PROFESSIONAL MEETING PRESENTATIONS

- Wiggins, G., Adkins, B., Mills, Z., **Oyedeji, O.A.,** Finney, C., and Parks, J. **2019** Reduced-Order Modeling Techniques for Fluidized-Bed Biomass Pyrolysis. TC
- Cruz, B., **Oyedeji, O.A.,** Ramirez, E., Daw, C., Abdoulmoumine. N. **2018.** Determining and modeling the residence time distribution of biomass particles in a bench-scale bubbling fluidized bed reactor. ASABE Annual International Meeting. Detroit, Michigan.
- Oyedeji, O.A.,** Abdoulmoumine. N. **2018.** Simulation of biomass gasification performance using non-stoichiometric equilibrium method. ASABE Annual International Meeting. Detroit, Michigan.
- Oyedeji, O.A.,** Abdoulmoumine. N. **2018.** Simulation of nitrogen contaminants during biomass gasification using CFD-DEM approach. ASABE Annual International Meeting. Detroit, Michigan.
- Oyedeji, O. A.,** and Abdoulmoumine, N. **2017.** Kinetic investigation of the formation of biomass syngas precursors. Presented at: ASABE Annual International Meeting. Spokane, Washington.
- Ownby, M., **Oyedeji, O. A.,** Liu, Q., and Abdoulmoumine, N. **2017.** Devolatilization kinetics of high ash containing switchgrass and park bark by differential thermogravimetry (DTG). Presented at: ASABE Annual International Meeting. Spokane, Washington.
- Houston, R., **Oyedeji O. A.,** and Abdoulmoumine, N. **2017.** Development of a comprehensive computational fluid dynamics and discrete element model of biomass fast pyrolysis in a bubbling fluidized bed reactor Presented at: ASABE Annual International Meeting. Spokane, Washington.
- Oyedeji, O. A.,** and Abdoulmoumine, N. **2016.** Computational fluid dynamics (CFD) modeling of a bench-scale fluidized bed biomass gasifier using OpenFOAM. Presented at: ASABE Annual International Meeting. Orlando, Florida.
- Oyedeji, O. A.,** Sokhansanj, S., and Webb, E. **2016.** Spatial analysis of stover moisture content during harvest season in the united states. Presented at: ASABE Annual International Meeting. Orlando, Florida.
- Oyedeji O. A.,** Fasina, O., Adhikari, S., and McDonald, T. **2015.** Effects of moisture content and storage time on specific grinding energy and physical properties of loblolly pine. Presented at: ASABE Annual International Meeting. New Orleans, Louisiana.
- Young A., **Oyedeji, O. A.,** Fasina, O., Adhikari, S., and McDonald, T. **2015.** Influence of moisture content, tree height, and tree radius on toughness and strength of loblolly pine. Presented at: ASABE Annual International Meeting. New Orleans, Louisiana.
- Oyedeji, O. A.,** and Fasina, O. O. **2014.** A study on the moisture and storage effects on the specific grinding energy and some physical properties of loblolly pine. Presented at: Graduate Engineering Research Showcase. Auburn University, Alabama.

Oyedeji, O. A., and Fasina, O. O. **2014**. Influence of moisture content and storage time on the grindability and some physical properties of loblolly pine. Presented at: The Annual Meeting of South-eastern Partnership for Integrated Biomass Supply Systems (IBSS). The University of Tennessee, USA.

Ogunsina, B. S., Ojolo, S. J., Ohunakin, O. S., **Oyedeji, O. A.**, Matanmi, K. A., and Bamgboye, I. A. **2012**. Potentials for generating alternative fuels from empty palm fruit bunches by pyrolysis. Presented at: The International Conference on Clean Technology and Engineering Management. Covenant University, Nigeria.

Oyedeji, O. A., Agbetoye, L. A. S., and Adedeji, O. T. **2011**. Development of a Cassava Stem Planter. Presented at: The 11th International Conference and 32nd Annual General Meeting of the Nigerian Institution of Agricultural Engineers. University of Ilorin, Nigeria.

CERTIFICATIONS

Essential Computational Fluid Dynamics Course , CFD Direct, Reading, United Kingdom.	2017
Applied Computational Fluid Dynamics Course , CFD Direct, Reading, United Kingdom.	2017
OpenFOAM Foundation Course , OpenCFD Limited (ESI Group), Bracknell, United Kingdom.	2016
OpenFOAM Advanced Course , OpenCFD Limited (ESI Group), Bracknell, United Kingdom.	2016
Executive Certificate in Computer Studies , Federal University of Technology, Akure, Nigeria.	2009

SKILLS AND PROFICIENCIES

- Computer Programming with C++, Python, R, and Fortran
- Statistical Analysis and Modeling
- Machine Learning Algorithms
- Computational Fluid Dynamics (CFD)
- Discrete Element Modeling (DEM)
- Linear Programming and Critical Path Analysis
- Engineering Drawing
- Statistical DOE
- Analytical Method (GC-MS, XRF, ICP, HPLC, XRD, EDS, SEM)

MANUSCRIPT REVIEW EXAMPLES

ACS Sustainable Chemistry & Engineering, Separation Science and Technology, Industrial Crops and Products, Powder Technology, Transaction of the ASABE, ACS Energy & Fuels, Sustainability, Renewable Energy, Applied Engineering in Agriculture, BioResources.